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Countryside Council for Wales

Gwent Ecology

(Gwent Land Management Ltd)

Gwent Brownfield Baseline Survey 2010

Final Report

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CONTENTS

1 EXECUTIVE SUMMARY

Open Mosaic Habitats on Previously Developed Land (OMH) were identified as a UK Biodiverisity Action Plan Priority Habitat in 2007. They can be very rich in biodiversity, and are particularly important for plants and invertebrates. The Welsh Urban and Brownfield Ecosystem Group have responsibility for setting Welsh objectives and targets for OMH.

An initial study by ADAS, commissioned by DEFRA, produced a definition for OMH based on the structure of the site, namely the interplay between vegetation and bare ground. This study, funded by the Welsh Assembly Government through the Countryside Council for Wales, aims to test the ADAS definition, and set a baseline for the extent, location and types of OMH in Gwent.

This is a desk based survey that uses GIS data from Ordinance Survey (locations of quarries etc), Environment Agency (historic and current landfill) and the CCW Phase 1 Survey (habitats likely to qualify as OMH), together with aerial photography to identify potential OMH. These sites were then classified according to substrate type and likelihood of meeting the OMH criteria. The results were further refined by discussion with LBAP officers.

The survey found 640 potential OMH sites within Gwent, covering an area of 1909.35ha. Of these, 115 (946.14ha) were considered to have high or medium/high potential to meet the OMH criteria. Coal spoil was the commonest substrate, although areas of landfill, extraction and mixed substrate sites were also significant. There was considerable variation between LBAP areas.

In applying the OMH criteria, this survey encountered several issues. These included the resolution of the mosaic between vegetation and bare ground, and interaction with other habitat types. The study also highlights the need to revise the criteria used by LBAPs for protecting sites, as currently these are based on vegetation and are more likely to apply to mature sites that do not meet the OMH criteria.

It is considered that elements of this survey could be repeated across Wales to give a national baseline, although further work is needed to ground truth this study to determine its accuracy. A ‘best guess’ welsh baseline is estimated at 13128ha. It is important to note that many OMH actions can proceed without a baseline, and these are given as BAP actions in BARS.

2 INTRODUCTION

2.1 Brownfield Land and Biodiversity

Although a growing number of conservationists were aware of the importance of brownfield land for biodiversity, it wasn't until 2007 that 'Open mosaic habitats on previously developed land' (OMH) were identified as a UK Biodiversity Action Plan Priority Habitat. Brownfield sites can be particularly important for plant and invertebrate diversity – the invertebrate rarity and diversity of some sites is only equalled by that of ancient woodland[1].

The factors influencing the biodiversity of brownfield sites include the underlying substrate, the site history and the current levels of disturbance. The nature of the substrate often leads to arrested succession, or prevents dominance of any particular species. A history of disturbance leads to heterogeneity in the topography of a site, which provides opportunities for a diverse range of species[2]. Similarly, continuing disturbance of a site can also arrest succession and provide topographic variation.

Species-rich brownfield sites also have an important role in the wider landscape. They are likely to represent biodiversity hotspots within urban areas, enabling other green spaces such as parks and gardens to support a greater variety of wildlife. As a result of agricultural pressures, some species that are traditionally associated with the countryside are now more often found on brownfield sites, where groups of sites collectively provide enough resources to support them. Species such as the shrill carder bee (*Bombus sylvarum*) are now increasingly dependent on networks of brownfield sites.[3]

2.2 Open Mosaic Habitats on Previously Developed Land

Brownfield habitats are notoriously diverse and therefore difficult to define. Even as OMH was added to the UKBAP Priority Habitat list, it was stated that '*the habitat is best defined in terms of structure and growth forms, rather than through specific vegetation communities*.' In 2009, ADAS produced a report, commissioned by DEFRA, which gave a definition of OMH and sought to take the first steps in mapping the OMH resource[4].

According to the ADAS definition, OMH sites must meet the following criteria:

A. The site is at least 0.25 ha in size.
B. Known history of disturbance at the site or evidence that soil has been removed or severely modified by previous use(s) of the site.

[1] Barker, 2000
[2] BRIG (ed. Ant Maddock), 2008
[3] Buglife, 2009
[4] ADAS, 2009

C. The site contains some vegetation. This will comprise early successional communities consisting mainly of stress tolerant species (e.g. indicative of low nutrient status or drought).
D. The site contains unvegetated, loose bare substrate and pools may be present.
E. The site shows spatial variation, forming a mosaic of one or more of the early successional communities plus bare substrate, within 0.25ha.

2.3 Brownfield Land in Gwent

Gwent supports a diverse range of brownfield sites, because of the history of the region and the variety of landscapes within the five local authority areas. There are three broad landscape types within the region, roughly corresponding to the sub-areas of the Capital Network outlined in the Wales Spatial Plan. These are the Heads of the Valleys Plus, the Connections Corridor and the City and Coast.

In the Heads of the Valleys, the rich industrial history of the south Wales coalfields has left a legacy of spoil tips, quarries and mines, most of which are now disused and returning to a semi-natural state. This type of landscape dominates Blaenau Gwent, and the northern areas of Caerphilly and Torfaen.

Stretching from Monmouthshire across to the south of Caerphilly, the agricultural lowlands of the Connections Corridor do not seem to contain many brownfield sites, but on closer investigation are dotted with smaller quarries and pits, as well as occasional larger scale excavation and landfill sites.

In the south, the urban area of Newport supports distinctly different brownfield sites, such as vacant building plots and sites contaminated by heavy industry. Such typically urban sites are found in other built up areas and industrial estates across the region.

2.4 The Gwent Baseline Brownfield Study

The Welsh Urban and Brownfield Ecosystem Group was formed in 2009. The first priority of the Ecosystem group is to set Welsh BAP objectives and targets for OMH. The Ecosystem Group has identified the following actions as necessary to begin to set ‘Maintain Extent’ and subsequent BAP targets within Wales:

- Identify the extent and location of the total habitat resource
- Define the substrate types upon which Mosaic Habitats occur
- Identify the extent and location of sites on each substrate type
- Identify individual sites that are important for continuing management

In early 2010, Gwent Wildlife Trust was awarded a grant from the Welsh Assembly Government through the Countryside Council for Wales to carry out a desk-based study of brownfield sites in Gwent, through its consultancy, Gwent Ecology. This project intends to contribute to the delivery of the actions identified by the Ecosystem Group.

3 OBJECTIVES

3.1 Objectives

Using the actions identified by the Urban and Brownfield group as a starting point, the objectives of this project are:

- To identify the extent and location of potential OMH in Gwent
- To identify the extent and location of sites on each substrate type
- To identify individual sites for field survey and SINC assessment
- To suggest initial LBAP targets and actions for OMH in Gwent

The project will also test and evaluate the ADAS mapping methodology[5] and analyse how it could be used in other areas of Wales. The results of the project will also be used as an indicator of potential area of OMH across Wales.

3.2 Outputs

The project will deliver the following outputs:

- GIS layer showing potential OMH sites by broad type, and identifying those which are priority for field surveys
- Baseline data of potential OMH area, by LBAP area
- Suggested LBAP targets, in BARS format
- Suggested LBAP actions, in BARS format
- Final report of findings, detailing the above and discussing applications to other areas in Wales.

3.3 Scoping

In January, a short scoping report was circulated to members of the Urban and Brownfield Ecosystem Group and local authority LBAP officers and ecologists within Gwent. The report outlined the objectives and methodology of the project and asked some simple questions. Nine responses were received, and the following changes have been incorporated as a result:

- Data about the range of sizes of sites will be incorporated into the results
- Metal contaminated sites will be included, if found
- Examples of substrate types will be given
- Sites known to meet the ADAS criteria will also be put forward for further survey

Further details of the scoping report and responses can be found in Appendix 1.

[5] ADAS,2009

4 METHODOLOGY

4.1 Alert Map

A GIS 'alert map' of potential OMH sites was compiled using the following data:

Table 1: Data sources

Source	Data
Ordnance Survey (OS)	Paper maps, GIS raster layer
Countryside Council for Wales (CCW)	GIS Wales Phase 1 Survey 1979 – 1997
Environment Agency (EA)	GIS Landfill Inventory
Torfaen County Borough Council (TCBC)	GIS Inventory of Previously Developed Land

The OS maps were searched for the following industrial structures: gravel pits, other pit/quarry, landfill/slag heaps, levels and mines. A GIS layer was created marking each of these potential sites with a point.

The CCW Phase 1 layer was manipulated to extract the following vegetation types:

- I.2.1 Quarry
- I.2.2 Spoil
- I.2.3 Mine
- I.2.4 Refuse Tip
- J.1.3 Ephemeral vegetation
- J.4 Bare ground

The EA Landfill Inventory and TCBC Inventory of Previously Developed Land were not edited.

The resulting GIS layers were used simultaneously to give the 'alert map'.

It should be noted that, although the unitary authority of Gwent only extends to the River Rhymney, this survey included the whole of Caerphilly so as to provide meaningful data for the corresponding Caerphilly LBAP. It should also be noted that the area within the Brecon Beacons National Park (which extends into Monmouthshire, Torfaen and Blaenau Gwent) is excluded, as this falls under a separate LBAP.

4.2 Substrate Types

Each site was classified, as far as possible, by substrate type. The Urban and Brownfield Group has identified six broad substrate types, but these have not yet been clearly defined. The substrate types are coal spoil, extraction

(quarries and pits), metal contaminated, derelict, landfill, and coastal. For the purposes of this project these are defined as follows:

Table 2: Substrate definitions and examples

Substrate	Definition	Examples
Coal Spoil	Sites with a history of coal mining, and sites identified by OS as spoil but **not** registered as landfill	Coal spoil heaps, in various forms
Extraction	Sites identified by OS as Gravel pit, Sand pit, or Other pit/quarry, and sites appearing as such on aerial photographs, but **not** registered as landfill	Quarries, spoil heaps other than coal, derelict mines
Metal contaminated	Sites with history of metal contamination, but **not** registered as landfill	Lead mines, steelworks
Landfill	Sites registered as current or historic landfill	Active landfill, former landfill that has been capped
Coastal	Sea defences, man made bunds, or docks	Sea walls, bunds
Derelict	Sites not meeting any of the above criteria	Vacant building plots, derelict industrial sites, ruins of buildings

4.3 Aerial Photography

Using Google Earth with an OS grid square overlay, each square kilometre of the study area was searched for potential OMH sites, paying particular attention to any sites shown on the 'alert map' of potential OMH sites.

Sites shown on the alert map were eliminated if:

- They had been developed or successfully landscaped
- They were not visible as distinct from the surrounding landscape
- They were completely overgrown with mature vegetation such as trees and shrubs

The distinction of 'successful landscaping' is made because many sites that have been reshaped and seeded with grasses still show indications of OMH. In these cases the underlying substrate still determines the form and vegetation of the site.

The following additional sites were identified as potential OMH:

- Bare ground with no sign of activity (no buildings or stored materials) as they may have vegetated in the time since the photograph was taken

- Sites appearing to match a particular substrate type, e.g. showing the distinctive colouring of coal spoil heaps.
- Sites that appeared to have been disturbed, showing topographical variation and appearing to be distinct from the surrounding landscape.
- Sites known to the surveyor to be likely to meet OMH criteria

The boundary of each potential OMH site identified by the process above was drawn onto a new GIS layer, including the following information:

- Site name
- Phase 1 code(s)
- If the site was identified on the EA Landfill map, whether the site was current or historic landfill
- If the site appeared on an OS map, how it was identified
- Substrate
- Potential to meet the OMH criteria
- Local Authority
- Size

4.4 OMH Criteria

Each site was classified according to the potential to meet the OMH criteria, as defined by ADAS.

Table 3: Indicators of OMH potential

Potential	**Indicators**			
High Medium/High Medium Medium/Low	Sites showing significant heterogeneity	Sites with a known history of disturbance	Sites known to meet the OMH criteria	Sites greater than 0.25ha
Low	Bare sites, vegetated sites	Sites with an unknown or unclear history	Sites likely to be developed	Sites less than 0.25ha

4.5 LBAP meetings

Gwent Ecology met with local authority officers in each LBAP area. The decision as to which officers (LBAP officers or Ecologists) attended was left to each local authority, and was usually dependent on familiarity with the local area.

At each meeting, the local authority officers were presented with a map of the potential OMH sites in their LBAP area. Once officers were familiar with the OMH criteria, they were asked to eliminate sites that definitely did not meet the criteria (usually those that had been developed since the aerial photographs were taken). Officers were also free to extend or reduce the boundaries of the sites identified, and add sites that the survey had missed. In local authorities where a high number of sites had been identified, only the larger sites were considered.

Sites where officers were unsure if the site met the OMH criteria were also identified. Sites that are protected by designation (SSSIs, SINCs, LNRs) were identified. Aerial photographs, site surveys, maps of protected sites and planning databases were used to inform site selection and aid recall.

In addition to considering sites, conservation of OMH and possible LBAP actions were discussed. Issues such as the perception of brownfield land, understanding the definition of OMH, and protection and management of OMH were examined and are developed in the discussion section of this report.

5 RESULTS

5.1 Extent and location of potential OMH

The study identified a total of 640 potential OMH sites within Gwent, covering an area of 1909.35ha.

Table 4: Areas of potential OMH by LBAP area

LBAP area	Number of sites	Area (ha)	% of LBAP area
Blaenau Gwent	177	409.83	3.8%
Caerphilly	199	625.87	2.3%
Monmouthshire	78	90.00	0.1%
Newport	71	360.95	1.9%
Torfaen	115	422.70	3.4%

If OMH sites are assumed to be those classified as High to Medium/High potential, then the area is reduced to 946.14ha spread over 115 sites.

Table 5: Areas of high potential OMH by LBAP area

LBAP area	Number of sites	Area (ha)	% of LBAP area
Blaenau Gwent	28	156.10	1.4%
Caerphilly	31	296.98	1.1%
Monmouthshire	16	36.89	0.03%
Newport	11	170.19	0.9%
Torfaen	29	285.98	2.3%

5.2 Substrate type

It was not possible to identify the substrate type for all sites; therefore some sites are classified as ‘unknown’ substrate. Some sites can be a combination of substrates – quarries that have been part filled with landfill, for example, and these have been classified as ‘mixed’ substrates.

Coal spoil accounts for the majority of potential OMH. Landfill, extraction and mixed sites also form significant areas. Contaminated sites and coastal sites account for less than 1% of the area of potential OMH.

Figure 1: Substrate types in Gwent

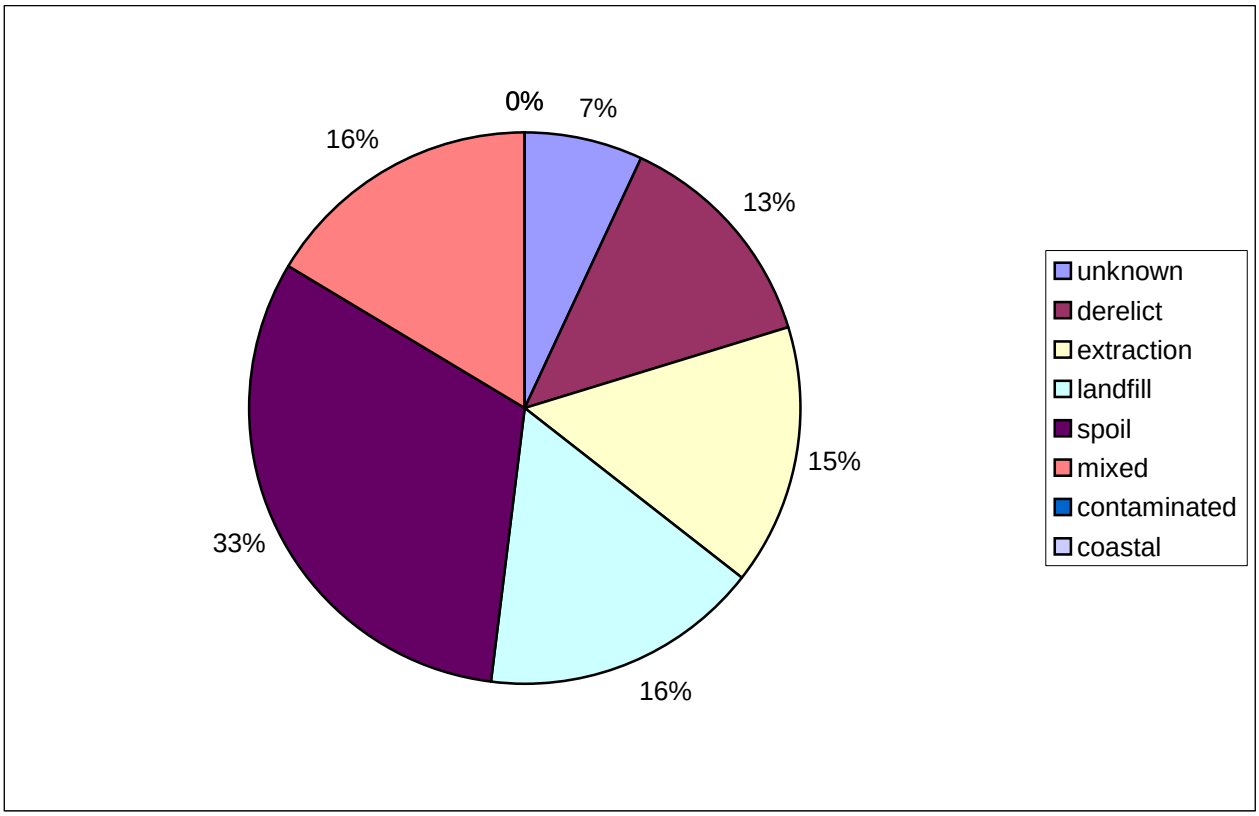


Figure 2: Substrate types in Blaenau Gwent

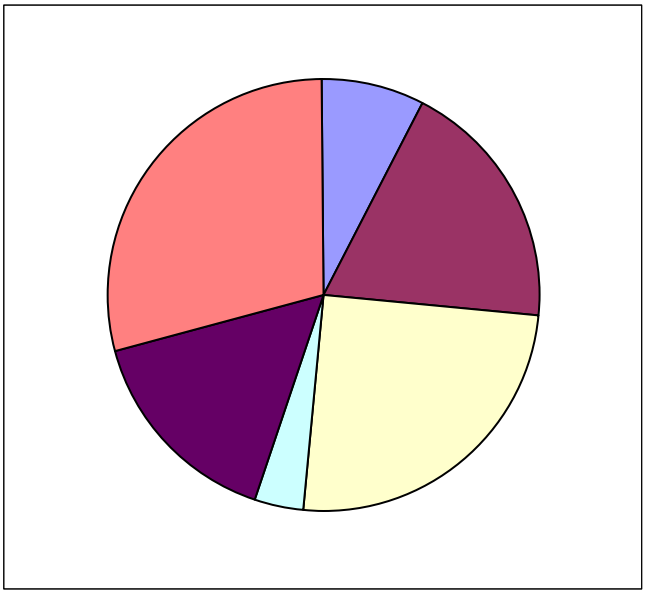


Figure 3: Substrate types in Caerphilly

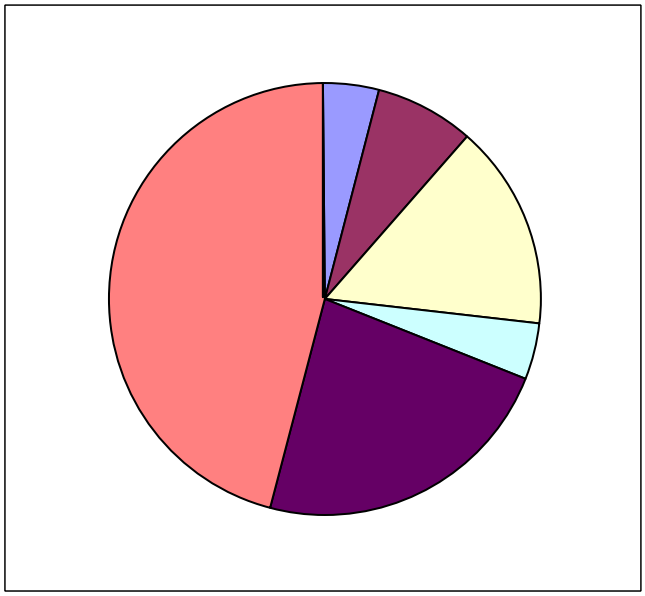


Figure 4: Substrate types in Newport

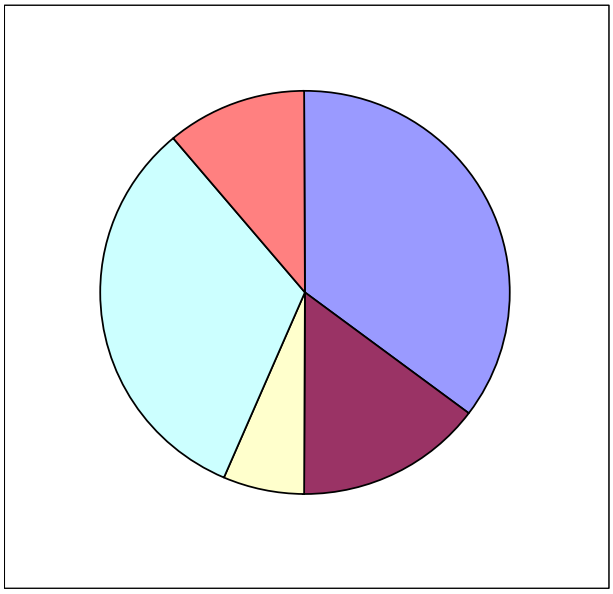


Figure 5: Substrate types in Torfaen

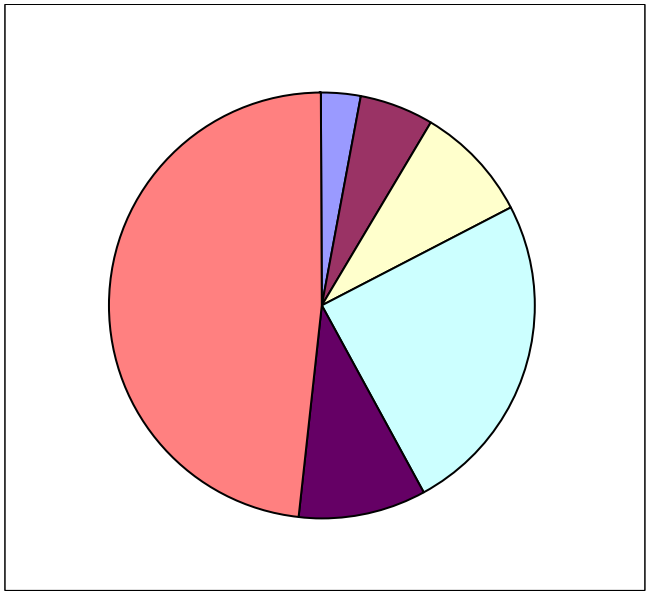
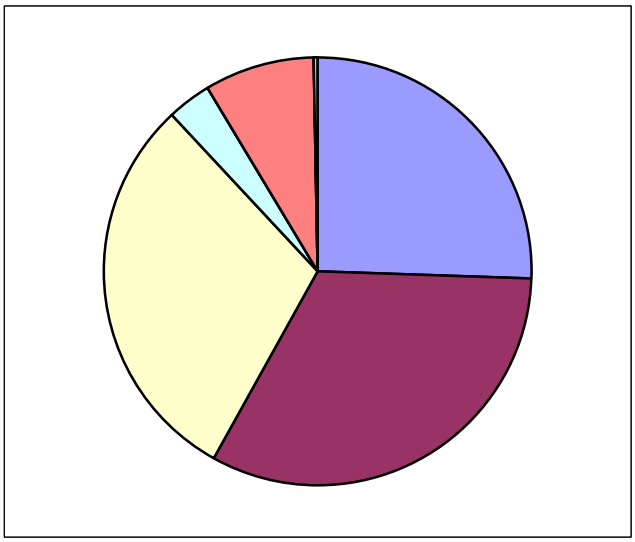


Figure 5: Substrate types in Monmouthshire



5.3 Sizes of sites

The ADAS criteria recommend a size threshold of 0.25ha. It was decided to ignore this in the initial gathering of data, in order to see how much potential OMH was represented by small sites (although smaller sites were assessed as lower OMH potential). The overall average (mean) site size is 2.98ha.

Eliminating sites that are less than 0.25ha from the overall baseline data for Gwent would result in the loss of 145 sites or 22.31ha (~1% of total area).

Figure 6: Frequency of site sizes by LBAP area

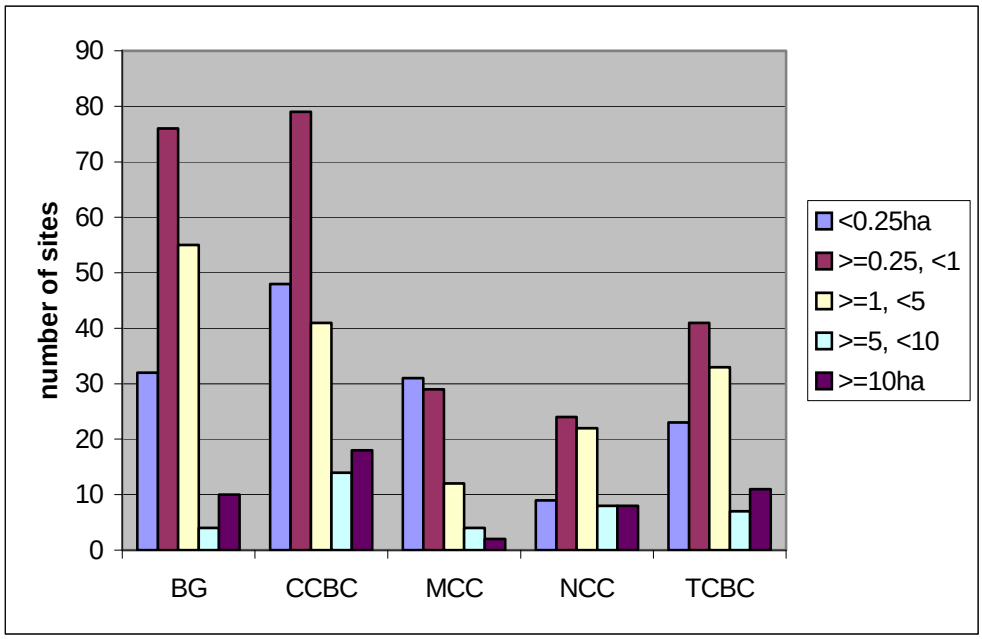
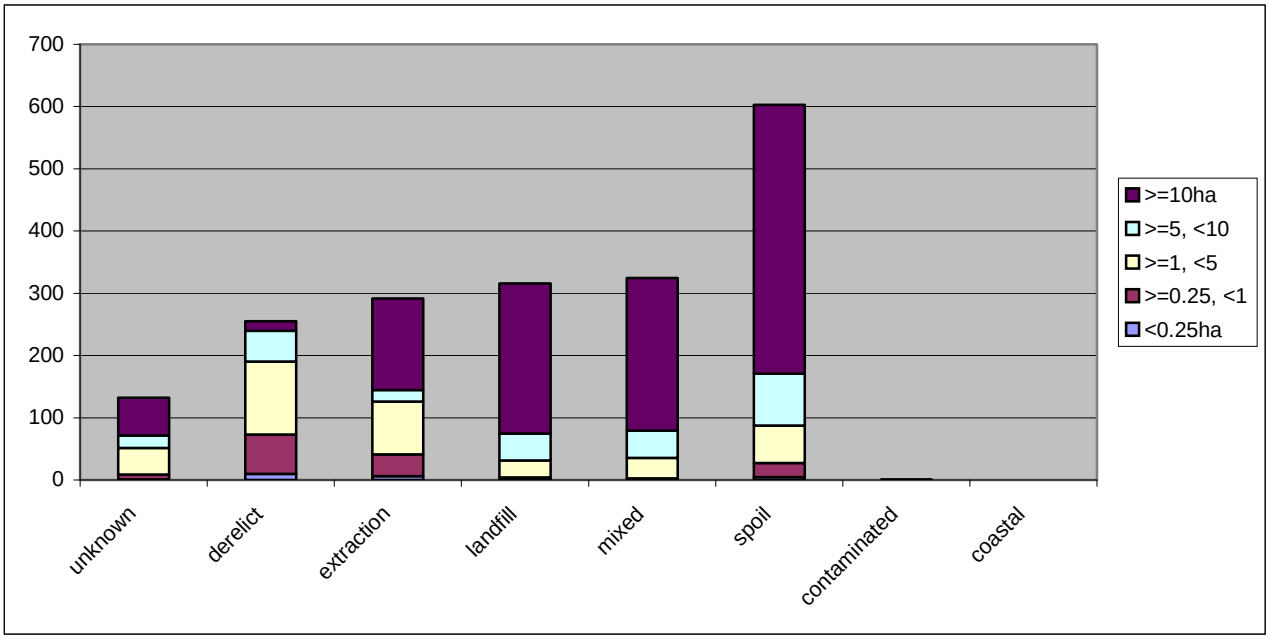


Figure 7: Overall areas of substrate types, broken down by site size



5.4 Protected sites

Some sites are already protected by designation as Site of Special Scientific Interest (SSSI), Local Nature Reserve (LNR) or Site of Importance for Nature Conservation (SINC).

Two sites (2.37ha) within Torfaen fall within The Blorenge SSSI, and four sites (4.86ha) within Newport fall with the Gwent Levels SSSIs. Six sites (1.78ha) in Monmouthshire fall into various SSSIs, such as the Gwent Levels, Severn Estuary, and Wyndcliff Woods.

Table 6: Potential OMH within locally designated sites

LBAP area	Sites in LNRs	Area in LNRs	Sites in SINCs	Area in SINCs
B. Gwent	11	42.00ha	35	39.53ha
Caerphilly	-	-	37	112.39ha
Monmouth	-	-	2	0.56ha
Newport	-	-	6	60.84ha
Torfaen	2	8.59ha	39	136.95ha
Total	**13**	**50.59ha**	**119**	**350.27ha**

Note that SINC sites in Newport are technically candidate SINCs.

6 DISCUSSION

6.1 Limitations of this survey

This survey is subject to a number of constraints and limitations.

Because the area and location of OMH is dynamic and fluctuating, the age of the data used for the mapping has a significant effect. This is most notable in the CCW Phase 1 survey, where ephemeral and bare sites had changed significantly, and in the aerial photographs where many sites had been lost to development. Although local authority officers were often able to identify sites that had changed or been lost, they were less likely to be able to identify any new sites that had become potential OMH, as this would require a very high level of familiarity with the local area.

Accuracy in mapping is also a limitation on the accuracy of the data. As the aerial photographs were used in parallel to GIS, rather than as a raster within GIS, there were greater chances of errors in drawing. Some site boundaries were difficult to determine because of their nature. Because accurate mapping takes more time, it was not seen as a priority in a time-limited project, so areas and boundaries should be interpreted as a rough guide only and subject to further study.

Further constraints are represented by the limit of knowledge of the desk-based surveyor and participating local authority officers. Although generally, the knowledge of the local area is high, it is not possible to recognise every site; therefore the degree of accuracy in assessing each site varies considerably.

As this study is desk based, the identification of potential OMH is limited. Although many sites can be clearly seen on aerial photographs, many sites with a finer grained mosaic could be missed.

6.2 Applying the OMH criteria

Although the ADAS criteria appear to be quite straightforward, there are inherent problems in applying them to sites. Here we discuss some of the issues faced in applying the criteria to sites to determine if they qualified as OMH:

Boundaries of OMH within mosaic sites: OMH often forms mosaics with other habitats, such as acid grassland or heath. Where this occurred, it was difficult to separate potential OMH from the other habitats in order to measure the area and determine boundaries.

Resolution: Criterion E states that '*the site shows spatial variation, forming a mosaic of one or more of the early successional communities plus bare substrate, within 0.25ha'*. This still allow for a range of mosaics from large scale to fine-grained mosaics. Aerially, the scale of the mosaic is difficult to

determine and there is no lower limit for fine-grained mosaic. As the extremes of resolution could be more suitably classified as other habitat types, greater clarification is needed.

Biodiversity: The purely spatial approach presented by ADAS (as a result of the initial habitat description put forward by the UKBAP) was sometimes considered to be too broad. Normally, sites are identified for protection on the basis of plant diversity, presence of indicator species or rare species; local authority officers were unsure how these criteria could be used to designate sites. The same criteria could identify a sparsely vegetated site supporting only a few species and a species-rich site. LBAP officers and ecologists need a method to highlight the most valuable sites for biodiversity.

Flux: OMH is probably one of the most dynamic habitat types. Although many sites show arrested succession, in others it is merely slowed or variable across the site. Indeed, the evidence that a brownfield site is slowly scrubbing over is often put forward by developers to show that protecting a site will not preserve biodiversity. Officers also wanted to identify sites that were likely to meet the criteria in the future. Identification of OMH needs to somehow take this into account.

Naturalness and disturbance: There is a degree of overlap between OMH and Inland Rock and Scree – the difference being that on OMH sites the disturbance is man-made rather than natural. However, there are a few sites where both can be applied – natural rockfall that has then been utilised by man, or landslip that has been stabilised, for example. Categorising these sites is difficult.

6.3 Evaluation of the methodology

This is a ‘catch-all’ method, followed by progressive refinement. Although the alert maps gave strong guidance, around 40% of sites were identified by aerial photograph alone. Generally, the initial desk based element ‘found’ most of the potential OMH sites known by local authority officers – with officers eliminating between 10 and 20% of sites (by number of sites, not area) but only adding up to 5 new sites.

Some types of substrate are better served by this method than others, with landfill sites and extraction sites most often identified by the alert map, and derelict sites least often identified.

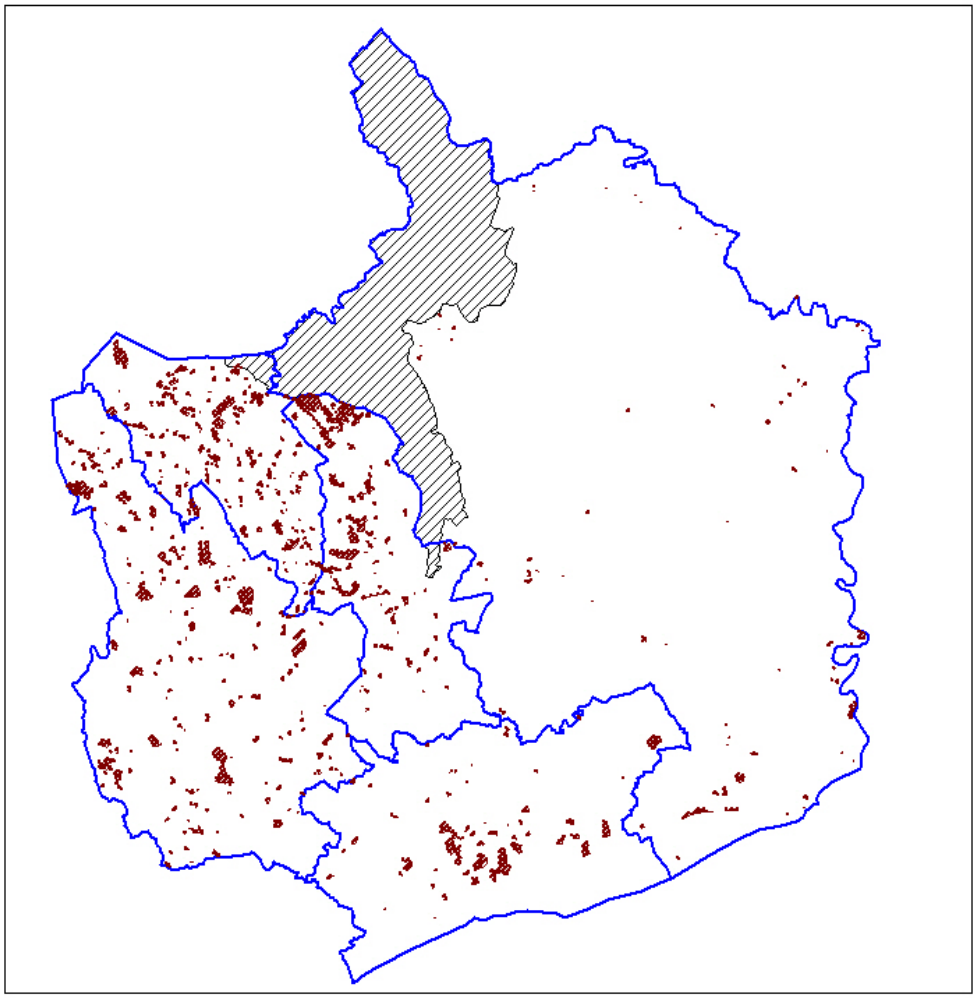
There is a high dependency on the knowledge of the desk-based surveyor and local authority officers. The surveyor must be able to recognise potential OMH from aerial photographs, and all need sufficient local knowledge and understanding of the criteria to assess individual sites.

Testing the methodology thoroughly will require site visits.

6.4 Extent and location of potential OMH

The results for area of potential OMH initially seem large. In a survey of LBAP officers' perceptions of brownfield land (undertaken by the Urban and Brownfield Ecosystem Group in 2009)[6], officers from Blaenau Gwent, Torfaen, and Newport all felt that they had large resources of brownfield land, with Caerphilly estimating that they had slightly less, and Monmouthshire estimating that they did not have much resource at all.

Figure 8: Distribution of potential OMH across Gwent



Newport seems to have less than expected – especially considering the urban nature of the area. This could be explained in several ways. Firstly, whilst Newport is perceived as an urban area, there are large tracts of rural land, such as the Gwent Levels, which have very few brownfield sites. Secondly, as previously stated, the survey methodology is less likely to pick up recent derelict sites, many of which are in the urban areas, so this figure may well be an underestimate.

[6] Jones, S. 2009

Blaenau Gwent and Torfaen are relatively rich in potential OMH, reflecting the industrial heritage of the areas. Although the north of Caerphilly shares this history, the south of the area is a mixture of urban areas and agricultural land, where there are fewer post-industrial sites. Caerphilly has also undertaken the most work in terms of remodelling and landscaping former industrial sites, making them less likely to meet the OMH criteria.

Monmouthshire has a very different distribution of potential OMH, although there are similarities to the south of Torfaen and Caerphilly, and the rural parts of Newport. This is characterised by small, thinly spread sites, with a few larger sites.

6.5 Substrate types

There are some issues with categorising sites into substrate types. For some sites (around 5% by area) it was possible to see that a site was disturbed or discern a mosaic, but the site history was unclear. Many of these sites are in Newport, where a lot of land has seen multiple uses over time. Without visiting these sites it is not really possible to categorise them. There were also a small number of sites that did not fit in any category easily – the most notable of these being rifle ranges, where the butts showed strong indicators of OMH.

Many sites (17% by area) fall under mixed substrates. These included:

- Extraction/spoil – mines with coal spoil heaps
- Extraction/landfill – quarries or mines that had been part filled with waste
- Derelict/extraction – quarries or mines with associated buildings and processing areas
- Derelict/landfill – vacant plots where part of the area is capped landfill

Separating these sites would take too much time, and counting sites as separate units could lead to some failing to meet the minimum size criteria. Unfortunately, grouping mixed sites together skews the data towards large areas of mixed substrate, particularly in Torfaen and Caerphilly. The actual combinations of substrate may be quite different.

A third of the area of potential OMH could be categorised as spoil. Surprisingly, most of this is in Caerphilly. In reality, there is probably more spoil in Torfaen and Blaenau Gwent, which is hidden within the mixed sites – as many sites in both are a mixture of spoil and extraction.

Extraction sites seem to be more evenly distributed, although there are fewer towards the coast in Newport, probably because of the underlying rocks and soils. Again, the mixed sites are likely to contain significant areas of extraction.

As expected, Newport has a high number of derelict sites, as does Blaenau Gwent. The Blaenau Gwent figure is affected by the large industrial estates along the A465.

Landfill areas are largely confined to Newport and Torfaen. This is not reflective of landfill distribution across the region, rather this highlights those sites that are no longer in use, but have not been successfully landscaped. In Newport, the area around the docks is mostly capped landfill, and many sites in the industrial areas have been used to dispose of hazardous waste.

There are very few metal contaminated sites. These are largely restricted to lead mines in Caerphilly and parts of the Llanwern steelworks in Newport. Many of the sites that are known to be contaminated are classified as landfill, because the contamination results from disposal of industrial waste. There are also some mixed sites with elements of contamination.

Only one site was classified as coastal. This was an old slipway site in Monmouthshire. The sea wall that runs along the length of the Gwent coast was judged not to qualify as OMH, being made of large concrete boulders with virtually no vegetation. Although there were many sites in the Newport docks area that were identified as potential OMH, most of these were former landfill, or more appropriately described as derelict. As Gwent contains the Usk and Wye estuaries, sites adjoining the rivers become progressively less 'coastal' in nature, making it difficult to judge how a site should be described. Further work is needed to refine the definition of a coastal site.

6.6 Sizes of site

Size of site is influenced by the nature of industrial sites. Landfill, mining and quarrying activities tend to be on a large scale in order to be viable, so there are more large sites than expected. This is reflected in the sizes of coal spoil, landfill, mixed and extraction sites.

There are also significant numbers of small extraction sites, mostly found in Monmouthshire. These are the small, older quarries and clay pits, and relicts of larger industrial sites.

As expected, derelict sites tend to be smaller, and there are also significant numbers of smaller extraction sites. Larger brownfield sites are more likely to be developed within a short space of time, so are less common.

The breakdown of site size by local authority is more difficult to explain. This is partly related to the types of substrate found, but also to the nature of the landscape, as the topography of the area can constrain the size of sites. Monmouthshire differs significantly from the other counties – size of sites could be affected by differences in mineral resources and the priority of agriculture over industrial land uses.

One of concerns with the ADAS criteria was the minimum size. Eliminating sites that were less than 0.25ha in size did affect a large number of sites (20%) – but only a very small area (1%). Although most of the very small sites are classified as low potential, a small number were classified as medium or

medium high potential, so there is a risk that this discounts sites of high nature conservation value.

6.7 Protected sites and SINC assessment

A surprising number of sites are already protected. This amounts to 409.87ha, which is 21% of the area of potential OMH (or 23% of sites). However, it is important to note that most of these sites have been designated for reasons other than their brownfield interest. Within the SSSIs, the potential OMH makes up a small area within a very large site. In Silent Valley LNR, the SSSI boundary skirts around the potential OMH. Many potential OMH sites form incidental features in large tracts of designated upland or woodland.

Within the region, each Local Authority uses different criteria for designating local sites (LNRs and SINCs). LNRs often use the SINC criteria for their nature conservation component, so it is appropriate to focus on SINC criteria for this project.

Blaenau Gwent and Caerphilly both use the Mid-Valleys SINC criteria[7]. The appropriate habitat type for OMH is H18: Mineral Spoil Tips and Post-Industrial Land. The criteria suggest that the following sites should be selected:

- *'All examples of species-rich mineral spoil tips/post-industrial land that have naturally re-vegetated with a diverse range of native and archaeophyte non-woody plant species. The constituent habitats will be assessed against individual habitat criteria as set out in this document or as part of large mosaic SINC.*

- *All examples of lichen-heath on mineral spoil tips which support the 8 key lichen-heath species identified in the Strategic Conservation Assessment of Heathland and Associated Habitats on the Coal Spoils of South Wales (Miller HS, Clarkson, B and Smith, PL., 2007)'*

With the exception of spoil tips, this criteria seems to direct selection of SINCs more towards sites that have mature vegetation, rather than retaining a mosaic of bare ground and vegetation. A brief discussion with local authority officers in Caerphilly revealed that many post-industrial sites that had been designated as SINCs would not qualify as OMH.

Monmouthshire, Newport and Torfaen use the Guidelines for the Selection of Wildlife Sites in South Wales[8], although the Newport system for designating sites is still in its early stages. Again, H18: Post-Industrial Land is focussed on *'all examples of post industrial land that has re-vegetated with a diverse range of native and archaeophyte non-woody plant species.'* These guidelines differ from the Mid Valleys in that they offer a species list.

[7] Mid Valleys SINC group, 2008
[8] South Wales Wildlife Sites Partnership, 2004

Torfaen is probably the most flexible in their approach to designating sites – which has allowed them to protect a significant proportion of their potential OMH (34%). The SINC criteria used by all local authorities pre-date the definition of OMH, so it is likely that they will need to be updated to take OMH into account. However, the question of biodiversity value (as raised in section 5.2) still needs to be addressed so that the best examples of OMH can be identified and designated in a defensible manner.

6.8 Initial LBAP targets and actions for OMH in Gwent

It is likely that the total area of potential OMH is an overestimate. To give a more realistic estimate, we recommend using those sites judged to be of high or medium high potential to give the following baseline:

Table 7: Baseline estimates of OMH

LBAP area	Number of sites	Area (ha)
Blaenau Gwent	28	156.10
Caerphilly	31	296.98
Monmouthshire	16	36.89
Newport	11	170.19
Torfaen	29	285.98
Total	**99**	**909.25**

As stated in an informal discussion paper produced by the Urban and Brownfield Group[9], target setting for OMH is not a straightforward process. A high rate of turnover, interaction with other habitat types and the general perception of brownfield sites are all significant factors to consider.

Maintain Extent: It is suggested that this target has a dual component. This would consist of the maintenance of an overall area of OMH – 80% of the baseline, for example, and maintenance of the proportions of each substrate within the LBAP area. Greater clarity would be gained from separating mixed sites and decreasing the number of sites with unknown substrates.

Table 8 Example targets: Maintain Extent

LBAP	Overall area of OMH		Maintain Extent	
Newport	170.19ha		136.15ha	
Substrates	Mixed	Landfill	Derelict	Extraction
Current %	11%	33%	15%	6%
Target %	>8.8	>26.4%	>12%	>4.8%

Achieve condition and restore: Given the nature and varied ownership of OMH sites. It would be preferable for LBAPs to identify sites where they are able to influence site management and generate targets on this basis.

[9] Frost, P., 2009

Extend the resource/create: Again, there are two elements to setting this target. Firstly, LBAP partnerships need to engage with the processes that generate new OMH in order to influence their management and any restoration processes. Some LBAP officers were already engaged with large industrial sites such as quarries and landfill sites and therefore have the potential to influence the restoration process, but it is likely that further work could be done.

Secondly, there are opportunities to 'create' OMH on small sites that may be subject to less development pressure than larger sites, or as part of development of larger brownfield sites. These could include brown roofs and bug banks, for example. For most habitats, Welsh targets set creation at between 1-5%. For OMH, further work is needed to assess the turnover of sites before targets can be set.

There is not yet enough confidence in this baseline data to definitively set targets. However, local authority officers did demonstrate enthusiasm and creativity in suggesting LBAP actions that could be adopted without reference to targets. Some could be applied to all LBAPs, whereas others would work better in certain areas, and some may be best undertaken by the Urban and Brownfield Ecosystem Group.

The suggested actions, as produced on BARS are:

Code	Action	Timescales
UB10	Revise SINC criteria to take account of the new OMH description and test revision	01/04/2010 - 31/03/2011
UB11	Survey and apply SINC criteria to sites identified as having high potential in the Gwent Baseline Brownfield survey.	01/04/2010 - 31/03/2011
UB12	Identify 'new' OMH sites that may have been missed by the Gwent Baseline Brownfield survey in small areas such as industrial estates.	01/04/2010 - ongoing
UB13	Produce an inventory of potential future OMH sites together with possible timescales for closure.	01/04/2010 - ongoing
UB2	Survey sites identified in the Gwent Brownfield Baseline Survey using volunteers to ground truth the data	01/04/2010 - 31/03/2011
UB3	Prioritise sites identified in the Gwent Brownfield Baseline Survey for additional detailed surveys, to test survey methodology	01/04/2010 - 31/03/2011

UB4	Establish contact with site owners/managers of industrial estates and large sites undergoing restoration to influence habitat development.	01/04/2010 - 31/03/2011
UB5	Cross reference sites from the Gwent Brownfield Baseline Survey with LDP candidate sites to check for likely development and seek opportunities for sensitive habitat creation.	01/04/2010 - 31/03/2011
UB6	Identify opportunities for small scale habitat creation in industrial or landscaped areas.	01/04/2010 - 31/03/2011
UB7	Compile and produce guidance on the management of OMH sites.	01/04/2010 - 31/03/2011
UB8	Compile and produce guidance on the management of OMH sites for planning officers	01/04/2010 - 31/03/2011
UB9	Raise awareness of the biodiversity value of OMH sites by using flagship species	01/04/2010 - 31/03/2011

LBAP officers are able to select actions that they are able to undertake and adapt them for their area. Some actions can be supported by the Urban and Brownfield Ecosystem Group.

6.9 Applications across Wales

Although the survey methodology is relatively simple, the checking of aerial photographs is very time consuming, and relies on some knowledge of post-industrial sites. It would be unrealistic to expect many welsh LBAP partnerships to undertake this work, although those areas that feel they have a lot of brownfield interest may well want to.

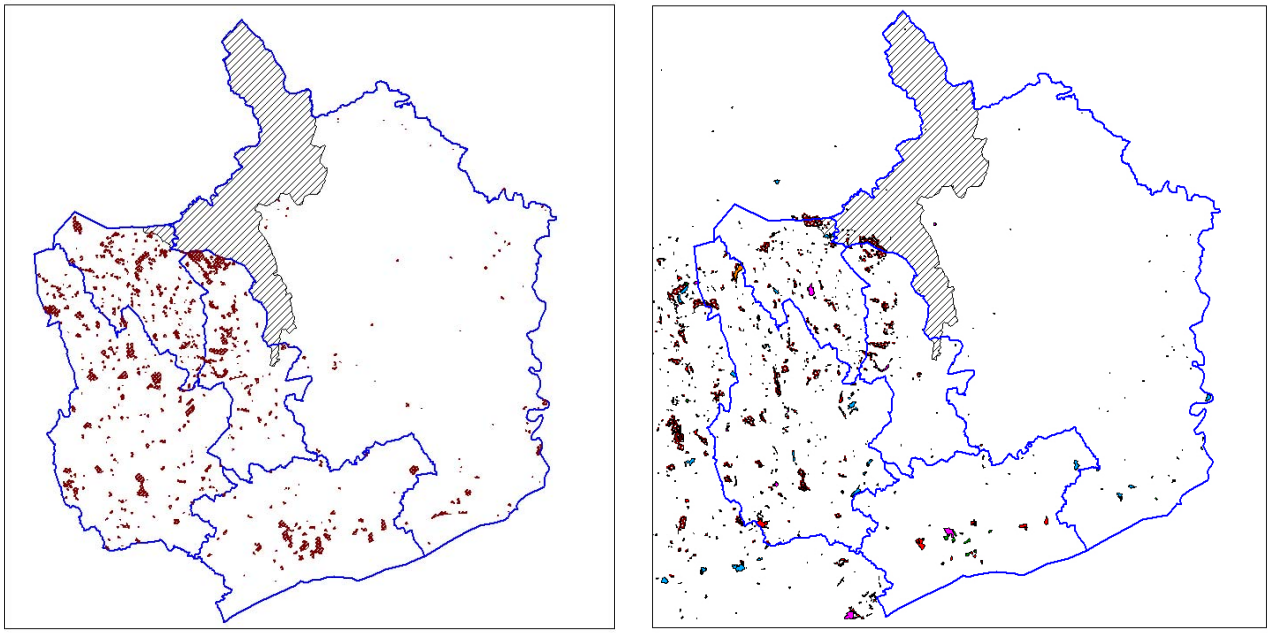
This study area is quite small, yet there is a relatively large area of potential OMH within the valleys. Even assuming OMH accounts for 0.6% of each local authority area and applying this to the whole of Wales gives an unfeasibly large baseline of 1,246,740ha. It is worth noting that the only 3 LBAP partnerships in Wales that estimated that they have a very large area of brownfield resource are within Gwent (Blaenau Gwent, Newport and Torfaen), and only 6 (including Caerphilly) estimated that they have a relatively large area of brownfield resource[10].

The CCW Phase 1 layer can give a very broad indication of the area of potential OMH, as shown by Figure 9. Although this is unlikely to give an

[10] Brownfield LBAP survey, Jones, S. 2009

accurate prediction at the LBAP level, it is probably the best indication available at this stage. It can also be used to identify which LBAP areas should be priorities for OMH work. The combined areas of bare ground, ephemeral vegetation, mines, quarries, tips and spoil give an all-Wales estimate of 13,128ha.

Figure 9: Area of potential OMH (left) and CCW Phase 1 'alert map' (right)



Greater accuracy would be gained by analysing the alert maps to give the percentage of landfill sites, OS indicators, and selected Phase 1 habitats that have given rise to potential OMH. This way, the estimated baseline could be modified. However, this would not take regional variations in the changes in OMH over time into account, so the overall process may need to be repeated in selected areas across Wales to give a more balanced guide.

At the moment, testing of this survey on the ground is a priority to assess both the survey technique and the baseline generated so far. The results from the field can then be used to refine the all-Wales estimate further.

7 NEXT STEPS

There are several key actions that need to be undertaken to continue the process of developing a baseline for OMH in Gwent, and estimating a baseline for Wales. The draft report for this project has been circulated, but only two comments received. These were very positive and made no specific suggestions for changes.

Developing a baseline for OMH in Gwent is mostly concerned with ground truthing the sites identified as potential OMH. Our suggested way forward is a multi-level approach involving both professionals and volunteers.

- A basic survey using a tick box form undertaken by volunteers. This will be used simply to ascertain whether a site still exists, and whether there is bare ground and vegetation present. This should be applied to sites where local authority officers were uncertain of current site conditions as a minimum, but could also be used to test a sample of other sites.

- A more comprehensive survey of a sample of sites – of varying OMH potential and substrate. Ideally this would be a random sample, but is more likely to depend on site ownership and access. This could be undertaken by GWT or LBAP partnerships, and would test the methodology.

- Further to this, LBAP partnerships may want to add the highest potential OMH sites to their SINC review list, to survey and assess against SINC criteria when resources allow.

Information as a result of these surveys can then be collated and analysed to give a more accurate baseline.

In terms of a Welsh baseline, it will be up to the Urban and Brownfield Ecosystem Group to determine the best way forward. There are several options, such as further data analysis and testing in other LBAP areas. However, the group may decide to wait for results from the field surveys before proceeding.

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9 ABBREVIATIONS

BAP	- Biodiversity Action Plan
CCW	- Countryside Council for Wales
DEFRA	- Department for Environment, Food and Rural Affairs
GWT	- Gwent Wildlife Trust
LBAP	- Local Biodiversity Action Plan
LNR	- Local Nature Reserve
OMH	- Open mosaic habitats on previously developed land
SINC	- Site of Importance for Nature Conservation
SSSI	- Site of Special Scientific Interest

Appendix 1 Scoping Report

Gwent Ecology

(Gwent Land Management Ltd)

Gwent Brownfield Baseline Survey 2010

Scoping Report

14th January 2010

GE Reference [WAG 040110]

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Reg. Charity No. 242619 Ltd Liability Co. No. 812535

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CONTENTS

1 Project Background

1.1 Urban and Brownfield Ecosystem Group

The Urban and Brownfield Ecosystem Group was formed in 2009, through the restructuring of the BAP process in Wales. Its remit is to drive the delivery of priority habitat targets (including those associated with relevant species), utilizing ecosystem principles and appropriate geographic scales, although the group is likely to consider biodiversity action beyond the priority habitat targets in the future.

The first priority of the Ecosystem group is to set Welsh objectives and targets for Open Mosaic Habitats on Previously Developed Land (OMH) – a new UK BAP Priority Habitat. There are certain inherent difficulties regarding target setting for this habitat type, and although we now have a clear definition for the priority habitat (Definition and mapping of open mosaic habitats on previously developed land: Phase 1, ADAS 2009) as yet we have no baseline for the area, location and value of the habitat resource within Wales.

The Ecosystem Group has identified the following actions as necessary to begin to set 'Maintain Extent' and subsequent targets:

- Identifying the extent and location of the total habitat resource;
- Defining the substrate types upon which Mosaic Habitats occur;
- Identifying the extent and location of sites on each substrate type;
- Identifying individual sites that are important for continuing management.

This project intends to contribute to the delivery of these actions, focussing on Gwent, as this area contains a wide range of landscapes and brownfield sites, and includes five LBAP partnerships. Gwent Ecology has a strong local knowledge of the area, giving greater accuracy and depth to the survey.

1.2 Priority Habitat Definition

The ADAS report[11] has developed a definition for OMH based on 5 simple criteria:

F. The site is at least 0.25 ha in size.
G. Known history of disturbance at the site or evidence that soil has been removed or severely modified by previous use(s) of the site.

[11] Definition and mapping of open mosaic habitats on previously developed land: Phase 1 Final Report, ADAS, 2009

H. The site contains some vegetation. This will comprise early successional communities consisting mainly of stress tolerant species (e.g. indicative of low nutrient status or drought).
I. The site contains unvegetated, loose bare substrate and pools may be present.
J. The site shows spatial variation, forming a mosaic of one or more of the early successional communities plus bare substrate.

The ADAS report also demonstrated that it was possible to identify OMH sites through desk survey, although a significant proportion of those sites identified as potential OMH did not meet all of the criteria when surveyed.

1.3 Project Delivery

This is a brief summary of the Gwent Baseline Brownfield Survey project. For more details, please refer to the Gwent Ecology tender. Gwent Ecology will undertake the following work:

1. Liaison with the Ecosystem Group and LBAP officers to establish the scope of the survey and gather existing data (this report).

2. A desk based survey to identify potential OMH sites.

3. Meetings with each LBAP officer to provide local knowledge and discuss possible LBAP targets and actions for OMH.

4. Production of a GIS map of potential OMH sites, showing broad substrate type, and identifying sites for future field survey.

5. Suggested LBAP targets and actions, in BARS format, for each partnership.

6. Final report of findings, detailing the above and discussing applications to other areas in Wales.

The project will deliver the following outputs:

- GIS layer showing potential OMH sites by broad type, and identifying those which are priority for field surveys
- Baseline data of potential OMH area, by LBAP area
- Suggested LBAP targets, in BARS format
- Suggested LBAP actions, in BARS format
- Final report of findings, detailing the above and discussing applications to other areas in Wales.

2 Objectives and Methodology

2.1 Objectives

Using the actions identified by the Urban and Brownfield group as a starting point, the objectives of this project are:

- To identifying the extent and location of potential OMH in Gwent;
- To identify the extent and location of sites on each substrate type;
- To identify individual sites for field survey and SINC assessment.
- To suggest initial LBAP targets and actions for OMH in Gwent

The project will also test and evaluate the ADAS mapping methodology and analyse how it could be used in other areas of Wales. The results of the project will also be used as an indicator of potential area of OMH across Wales.

2.2 Site Identification

Sites will be identified using Ordinance Survey (OS) maps and existing datasets, such as the CCW Phase 1 Survey and EA Landfill inventory.

The following sites will be checked against aerial photography to assess whether they are likely to meet the OMH criteria:

Source	Site types
OS Maps	Gravel pit, Sand pit, Other pit/quarry, Landfill/Slag heap
CCW Phase 1 Survey	Mine, Quarry, Spoil, Tip, Bare ground, Ephemeral vegetation
EA Landfill Inventory	Current landfill, Historic landfill

Following the advice of the ADAS report, this will be accompanied by a systematic search of aerial photographs to identify additional sites.

Gwent Ecology and the LBAP officer for each county will then review the identified sites. This will further refine the data by eliminating some sites (such as those that have been recently developed) and highlighting those expected to be of greatest biodiversity value.

Note: At this stage we intend to discount the size criteria for OMH, as the data will be used at a local level where the identification of smaller sites of potential biodiversity value is useful for LBAP partnerships.

2.3 Substrate Types

The Urban and Brownfield Group has identified six broad substrate types, but these have not yet been clearly defined. The substrate types are coal spoil, extraction (quarries and pits), metal contaminated, derelict, landfill, and coastal. For the purposes of this project these are defined as follows:

Coal Spoil	Sites with a history of coal mining, characterised by an acidic community, sites identified by OS as spoil but **not** registered as landfill
Extraction	Sites identified by OS as Gravel pit, Sand pit, or Other pit/quarry, but **not** registered as landfill
Metal contaminated	Not considered - no known sites within Gwent
Landfill	Sites registered as current or historic landfill
Coastal	Sea defences, man made bunds, or docks
Derelict	Sites not meeting any of the above criteria

2.4 Further survey and assessment

The following sites will be identified as priorities for further survey and assessment:

- Sites of 2.5ha or greater
- Sites judged by Gwent Ecology and LBAP officer as likely to meet SINC criteria.

3 Next Steps

This report forms a short consultation exercise involving LBAP officers and the Urban and Brownfield Ecosystem Group. Once comments have been received and any necessary amendments made to the scope, the desk survey phase will begin.

Consultation meetings with LBAP officers to refine and prioritise the list of sites identified as potential OMH, and to discuss LBAP targets and actions, are expected to take place in early February.

Gwent Ecology will aim to circulate a draft report for comment by the 19th February.

4 Scoping Questions

Thank you for taking the time to review this report. Please answer the following questions:

1) Do you agree with the objectives of this project?

2) Do you agree with the range of sites identified from maps and datasets?

3) Does your organisation have any additional GIS based datasets that we could use?

4) Do you agree with the decision to include small sites in this project?

5) Do you agree with the definitions of each substrate type?

6) Do you agree with the criteria for further survey and assessment?

Please send your response to Sorrel Jones (sjones@gwentwildlife.org) by Wednesday 20th January.

APPENDIX 2 SCOPING RESULTS

The scoping report was circulated to the Urban and Brownfield Group, LBAP officers and local authority ecologists within the survey area. We asked six simple questions about the scope and outcomes of the project. We received nine responses. Three were from the Urban and Brownfield Group and six were from LBAP officers and local authority ecologists (representing all five LBAP partnerships within the study area).

Summary of Responses

7) Do you agree with the objectives of this project?

   All respondents agreed that with the objectives listed. There were some concerns that this study may not be sufficient to set numeric LBAP targets. Respondents also highlighted the importance of identifying sites and analysing the variety of brownfield sites that are found across Gwent.

8) Do you agree with the range of sites identified from maps and datasets?

   All respondents agreed with the range of sites identified for consideration. One respondent expressed concern over the limited sources of data, but felt that this was understandable given the nature of the project. The importance of using local knowledge to supplement the datasets was emphasised.

9) Does your organisation have any additional GIS based datasets that we could use?

   Various datasets and information were offered.

10) Do you agree with the decision to include small sites in this project?

   All respondents agreed with this decision. Respondents from LBAP partnerships felt particularly strongly about this, stating that this would be beneficial at the local level with LBAPs and SINC programs. Responses from the Urban and Brownfield Group stated that it would be useful to know the range of site sizes and also assess whether the 0.25ha cut off point suggested by ADAS is appropriate.

11) Do you agree with the definitions of each substrate type?

   Respondents mostly agreed with the definitions, although some concern was expressed about eliminating contaminated sites. The suggestion was also made to include examples of substrate types. It was also noted that more fieldwork is needed on derelict sites.

12) Do you agree with the criteria for further survey and assessment?

Respondents mostly agreed with the criteria for further survey. Issues were raised over selection of larger sites (>2.5ha) with some respondents supporting this and others requesting consideration of smaller sites. It was also suggested that sites that definitely meet the criteria are also included.

Changes to the project as a result of the scoping exercise

The following changes will be incorporated into the project:

- Data about the range of sizes of sites will be incorporated into the results
- Metal contaminated sites will be included, if found
- Examples of substrate types will be given
- Sites known to meet the criteria will also be put forward for further survey